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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Hans-Peter-Weitzel et al.

Serial No.: 10/692,887

Filed: October 24, 2003

Group Art Unit: 1713

Examiner: Kelechi Chidi Egwim

For: Protective-Colloid-Stabilized Polymers In The Form Of
Their Aqueous Dispersions Or Of Their Water Redispersible Powders

Attorney Docket No.: WAS 0606 PUS

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief from the final rejection of claims 1 - 15 of the Office
Action mailed on February 27, 2006 for the above-identified patent application.

07/28/2006 SHASSEN1 00000010 10692887

01 FC:1402 500.00 0P I. **REAL PARTY IN INTEREST**

The real party in interest is Wacker Polymer Systems GmbH & Co. KG,
("Assignee"), having a place of business at Johannes-Hess-Strasse 24, Burghausen, Germany,
as set forth in the assignment recorded in the U.S. Patent and Trademark Office on October
24, 2003 Reel 014647/Frame 0965.

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8 (FIRST CLASS MAIL)		
I hereby certify that this paper, including all enclosures referred to herein, is being deposited with the United States Postal Service as first-class mail, postage pre-paid, in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 on:		
<u>July 25, 2006</u> Date of Deposit	<u>William G. Conger</u> Name of Person Signing	<u>[Signature]</u> Signature

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to the Appellant, the Appellant's legal representative, or the Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1 - 15 are pending in this application. Claims 1 - 15 have been twice rejected and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

No amendments have been filed after the final rejection was filed on March 31, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

There is only one independent claim pending. That claim is directed to a process for the production of a protective colloid-stabilized water-redispersible polymer powder from one or more monomers selected from the group consisting of vinyl esters of C₁₋₁₅ alkyl carboxylic acids, (meth)acrylic esters of C₁₋₁₅ alcohols, vinylaromatics, olefins, dienes, and vinyl halides [claim 1 as filed; specification page 3, lines 17 - 22] wherein during both the aqueous polymerization of the monomers and also during spray drying, partially hydrolyzed polyvinylalcohol/ethylene copolymers having an ethylene content of 1 - 15% by weight, a degree of hydrolysis of 80% to 95%, and a Höppler viscosity of 2 - 30 mPas are employed as the protective colloids. [Claim 1 as filed, page 3, lines 23 - 27; page 8, line 20 to page 9, line 2; page 10, lines 17 - 22; powders 1 and 2, pages 17 - 18.]

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 - 15 have been rejected under 35 U.S.C. § 102(b) as anticipated by Mayer et al. U.S. Patent 6,300,403 (hereinafter, "*Mayer '403*"); Mayer et al. published application 2001/0025078 (hereinafter, "*Mayer '078*"); Weitzel EP 1 110 978 A1 (English language equivalent U.S. 6,576,698; hereinafter, "*Weitzel '698*") or Weitzel EP 1 065 224 A1 (English language equivalent: U.S. 6,605,663; hereinafter, "*Weitzel '663*").

Claims 1 - 15 have also been rejected under 35 U.S.C. § 102(b) or §103(a) as unpatentable over Nakamae et al. U.S. Patent 6,001,903 (hereinafter, "*Nakamae*")

VII. ARGUMENT

The field of the invention pertains to redispersible polymer powders wherein a protective colloid is used during polymerization (to prepare a stable dispersion) and during spray drying (to ensure that the dried powders are redispersible). Redispersible polymer powders have been produced this manner for decades, almost always employing polyvinyl alcohol as the protective colloid. However, the claimed invention requires that specific, partially hydrolyzed ethylene/polyvinyl alcohol copolymers be used as the protective colloid both during polymerization and during spray drying¹. None of the prior art discloses, teaches, or suggests such a process.

Basic to the issues herein is an apparent mischaracterization of claim 1 by the Examiner. When the claims were originally filed, they included use of the specific partially

¹ These protective colloids will be referred to as "partially hydrolyzed ethylene/polyvinyl alcohols" or like terms herein for brevity. However, it is noted that the claims require a specific range for ethylene, a specific range of hydrolysis, and a specific range of Höppler viscosity.

hydrolyzed ethylene/polyvinyl alcohol copolymers in either or both of the polymerization and spray drying. However, during the European opposition,² references were identified which disclosed (but did not exemplify) the use of such ethylene/polyvinyl alcohol copolymers during polymerization only. These references have been cited to the United States Patent and Trademark Office. No reference disclosed using these specific protective colloids during both polymerization and spray drying, and as shown by Appellants' examples on pages 17 - 18, their use in both steps of powder preparation provide surprising and unexpected results.

In Appellants' response of December 13, 2005, the claims were amended to become process claims, and to require that the ethylene/polyvinyl alcohol copolymer be used in both polymerization and spray drying. Appellants' attorney, in the second paragraph of page 5 of the response, stated:

The references cited have also resulted in the presentation of amended claims, submitted herewith. The claims now require that the EVOH protective colloid be used for both polymer preparation by emulsion or suspension polymerization, as well as in spray drying, as exemplified by powders 1 and 2 on page 17 of the application. (emphasis added).

Appellants further stated on page 6 of their response:

Appellants' claims require that EVOH protective colloids be employed both during polymerization and during spray drying, which the art does not teach or suggest. None of the references cited by the Examiner and none of the references cited in the opposition teach or suggest this result. All references known employ PVOH as the protective colloid for spray drying. (emphasis added).

² A copy was supplied to the Examiner attached to Appellants' Amendment Under 37 C.F.R. § 1.111 dated December 13, 2005./

Claim 1 as amended recites:

1. (Currently Amended) A process for the production of a protective-colloid-stabilized base polymer in the form of a water-redispersible powder, said polymer comprising a homo- or copolymer of one or more monomers selected from the group consisting of vinyl esters of optionally branched alkyl carboxylic acids having from 1 to 15 carbon atoms, (meth)acrylic esters of alcohols having from 1 to 15 carbon atoms, vinylaromatics, olefins, dienes, and vinyl halides wherein said polymer is prepared by emulsion polymerization or suspension polymerization in the presence of a protective-colloid and drying of the polymer dispersion thus obtained after addition of further protective colloid, wherein partially hydrolyzed vinyl acetate-ethylene copolymers with an ethylene content of from 1 to 15 mol%, with a degree of hydrolysis DH of the vinyl acetate units of $80 \text{ mol\%} < \text{DH} < 95 \text{ mol\%}$, and with a Höppler viscosity, in 4% by weight aqueous solution, of from 2 to 30 mPas, as measured by the Höppler method at 20°C, according to DIN 53015, are used as protective colloids.

It should be clear from the above that the claim describes one protective colloid used in polymerization, and a further protective colloid used in spray drying, and goes on to define the protective COLLOIDS (plural!). If a person states that he/she owns a house in Alexandria and a house in Fairfax, and the houses are colonials, then it is sure that both the Alexandria house and the Fairfax house are colonials. One would never interpret such language to mean that only the Fairfax house is a colonial or only the Alexandria house is a colonial. The same considerations apply here. The claim requires that a partially hydrolyzed ethylene/polyvinyl alcohol protective colloid be used during polymerization AND a partially hydrolyzed ethylene/polyvinyl alcohol protective colloid be used during spray drying. This is the only reasonable English language interpretation of the claim language, and is also how

one skilled in the art would interpret the claim. In this respect, *see In re Cortright*, 165 F.3d 1353, 1359; 49 USPQ 2d 1464, 1468 (Fed. Cir. 1999).³ Thus, for purposes of appeal, the claim must be interpreted as requiring at least one partially hydrolyzed ethylene/polyvinyl alcohol copolymer to be used as a protective colloid during polymerization, and at least one partially hydrolyzed polyvinyl alcohol copolymer to be used as a protective colloid during spray drying.⁴

A. The Claims Are Patentable Over The Weitzel and Mayer References.

The claims have been rejected over four references as being anticipated under 35 U.S.C. § 102(b).⁵ The references are *Mayer '403*, *Mayer '078*, *Weitzel '698*; and *Weitzel '663*. None of these references disclose the use of a partially hydrolyzed ethylene/polyvinyl alcohol copolymer for both polymerization and spray drying, and the Examiner has pointed to no passage in any reference which discloses such.

For example, *Mayer '403* discloses use of hydrophobically modified polyvinyl alcohols, preferably hydrolyzed copolymers of vinyl acetate and vinyl esters of α -branched

³ Appellants recognize that a claim is given its broadest reasonable interpretation during Examination. *In re Hyatt*, 211 F.3d 1367, 1372; 54 USPQ 2d 1664, 1167 (Fed. Cir. 2000). However, this interpretation, as stated, must be reasonable one, and cannot distort accepted usage of the English language. The reasonable scope must be as one skilled in the art would view the claim. *Cortright, supra*.

⁴ While Appellants believe the claim language to be clear on its face, they offered to amend the claim to recite equivalent language in their Amendment Under 37 C.F.R. § 1.116 dated March 31, 2006, by reciting use of the partially hydrolyzed ethylene/polyvinyl alcohol protective colloid. . . " both during emulsion preparation and as a further protective colloid added for drying." However, the Examiner did not even comment upon this offer, which leads Appellants to believe that he considered it not to alter the scope of the claim.

⁵ The four Mayer/Weitzel references were all cited to the Office directly or in the form of their foreign equivalents.

tertiary long chain carboxylic acids such as the VeoVa® vinyl esters formerly available from Shell. One proposed combination of monomers said to be suitable for preparation of a hydrophobic protective colloid suggests ethylene and vinyl acetate, the polymer subsequently being hydrolyzed. However, *Mayer* '403 never actually employed any such protective colloid even during polymerization, and employed only ordinary polyvinyl alcohol in spray drying. In *Mayer* '078, the disclosure is nearly the same as '403, except that the base polymer is a copolymer of a (meth)acrylate ester and a diene. Again, no EVOH polymer was actually used in any polymerization, and only ordinary polyvinyl alcohols are used for spray drying.

It is clear that none of the four *Mayer* and *Weitzel* references disclose use of Appellants' specific partially hydrolyzed ethylene/polyvinyl alcohol copolymers during both polymerization and spray drying, and thus the rejection of the claims over 35 U.S.C. § 102(b) must be reversed.

A.1. Claim 11 Is Separately Patentable Over The References

Appellants further note that while claim 1 does allow mixtures of protective colloids to be used in polymerization and spray drying, so long as each mixture contain a partially hydrolyzed ethylene/polyvinyl alcohol protective colloid, claim 11 requires that ethylene/polyvinyl alcohol protective colloids be the sole protective colloid.

B. The Claims Are Patentable Over *Nakamae*

Claims 1- 15 have been rejected over *Nakamae* et al. under either 35 U.S.C. § 102(b) or § 103(a). *Nakamae* is even further from the claimed invention than the foregoing references. *Nakamae* does not disclose any ethylene/polyvinyl alcohol copolymer as a protective colloid. Rather, *Nakamae* disclosed thiol-functional polyvinyl alcohol polymers (which may contain a broad range of additional comonomers including ethylene; *see* column

3, lines 10 - 34). This thiol-functional polyvinyl alcohol (which is not within the scope of Appellants' claims) is then chemically grafted onto the base polymer. *See Nakamae* at column 2, lines 29 - 32; column 2, lines 60 - 67. The thiol-functional PVA's of *Nakamae* are not protective colloids. Protective colloids are not bonded to the dispersed particles by sulfide or disulfide linkages. However, *Nakamae's* thiol-functional PVA's are so grafted, i.e. covalently bonded by sulfur linkages to the dispersed phase.

Nakamae, thus does not disclose a single ethylene/polyvinyl alcohol protective colloid: he discloses only reactive thiol-functional polyvinyl alcohol copolymers not within Appellants' claims. Moreover, the only disclosure of an actual protective colloid as that term is generally understood by those skilled in the art is in the comparative examples, where a fully hydrolyzed polyvinyl alcohol homopolymer (96% hydrolysis⁶) is used as a true protective colloid. *See* column 8, Comparative Example 1, Table 1. Thus, *Nakamae* not only does not disclose the partially hydrolyzed ethylene/polyvinyl alcohol protective colloids within the scope of Appellants' claims, using thiol-functional grafted polymers instead, he actually teaches against use of ordinary protective colloids during polymerization.

Nakamae does disclose use of protective colloids in spray drying of his polymer dispersions. However, for this purpose he proposes ordinary polyvinyl alcohols and other spraying assistants. *See*, column 4, line 62 to column 5, line 14.

⁶ In the polyvinyl alcohol art, hydrolysis of 95 mol% or greater is considered fully hydrolyzed, while less than 95% is considered partially hydrolyzed. It is assumed that the Board is familiar with the preparation of polyvinyl alcohol polymers and copolymers, which first require polymerization of a vinyl ester (almost always vinyl acetate or vinyl propionate, usually the former), since vinyl alcohol *per se* does not exist. Once the vinyl ester polymer or copolymer is produced, the vinyl ester groups are hydrolyzed (saponified) in strong base to convert pendant ester linkages to hydroxyl groups; "vinyl alcohol" moieties. The degree of hydrolysis can be varied so as to leave some ester (e.g. acetate) groups.

Nakamae not only does not disclose the claimed invention, he also does not teach or suggest it. Rather, he teaches away from using protective colloids during polymerization. Reversal of the rejections under 35 U.S.C. § 102(b) and/or § 103(a) over *Nakamae* is solicited.

B.1. Claim 11 Is Separately Patentable Over *Nakamae*

Claim 11 is separately patentable over *Nakamae*. Not only does *Nakamae* not disclose any partially hydrolyzed ethylene/polyvinyl alcohol copolymer as a protective colloid, he also does not teach the use of any protective colloid during polymerization, nor does he teach grafting the same thiol-functional dispersant during spray drying as he did during polymerization. Thus *Nakamae* does not teach or suggest using the same polymers during both polymerization and spray drying operations, even his very different thiol-functional polymers. Claim 11 is yet further removed from *Nakamae*, and withdrawal of the rejection of this claim over *Nakamae* is independently solicited.


Appellants submit that all the claims are patentable and solicit reversal of all the rejections.



The fee of \$500.00 as applicable under the provisions of 37 C.F.R. § 41.20(b)(2) is enclosed. Please charge any additional fee or credit any overpayment in connection with this filing to our Deposit Account No. 02-3978.

Respectfully submitted,

Hans-Peter-Weitzel et al.

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Enclosure - Appendices

VIII. CLAIMS APPENDIX

1. A process for the production of a protective-colloid-stabilized base polymer in the form of a water-redispersible powder, said polymer comprising a homo- or copolymer of one or more monomers selected from the group consisting of vinyl esters of optionally branched alkyl carboxylic acids having from 1 to 15 carbon atoms, (meth)acrylic esters of alcohols having from 1 to 15 carbon atoms, vinylaromatics, olefins, dienes, and vinyl halides wherein said polymer is prepared by emulsion polymerization or suspension polymerization in the presence of a protective-colloid and drying of the polymer dispersion thus obtained after addition of further protective colloid, wherein partially hydrolyzed vinyl acetate-ethylene copolymers with an ethylene content of from 1 to 15 mol%, with a degree of hydrolysis DH of the vinyl acetate units of $80 \text{ mol\%} < \text{DH} < 95 \text{ mol\%}$, and with a Höppler viscosity, in 4% by weight aqueous solution, of from 2 to 30 mPas, as measured by the Höppler method at 20°C, according to DIN 53015, are used as protective colloids.

2. The process of claim 1, wherein the degree of hydrolysis DH of the partially hydrolyzed vinyl acetate-ethylene copolymers is from 85 to 90 mol%.

3. The process of claim 1, wherein the ethylene content of the partially hydrolyzed vinyl acetate-ethylene copolymers is from 1 to 5 mol%.

4. The process of claim 2, wherein the ethylene content of the partially hydrolyzed vinyl acetate-ethylene copolymers is from 1 to 5 mol%.

5. The process of claim 1, wherein the protective colloid content is from 3 to 30% by weight, based on the base polymer.

6. The process of claim 2, wherein the protective colloid content is from 3 to 30% by weight, based on the base polymer.

7. The process of claim 3, wherein the protective colloid content is from 3 to 30% by weight, based on the base polymer.

8. The process of claim 4, wherein the protective colloid content is from 3 to 30% by weight, based on the base polymer.

9. The process of claim 1, wherein the selection of monomer and the selection of the parts by weight of any comonomers for the base polymer is such that the base polymer has a glass transition temperature T_g of from -50°C to $+50^{\circ}\text{C}$.

10. The process of claim 1, wherein from 0.05 to 50% by weight, based on the total weight of the base polymer, of auxiliary monomers are also copolymerized.

11. A process for preparing the protective-colloid-stabilized base polymer of claim 1, comprising polymerizing by an emulsion polymerization process where partially hydrolyzed vinylacetate-ethylene copolymers are the sole protective colloids employed.

12. In a formulation comprising an inorganic, hydraulically setting binder and a protective-colloid-stabilized polymer, the improvement comprising selecting as at least one protective-colloid-stabilized polymer, a protective colloid stabilized polymer prepared by the process of claim 1.

13. The formulation of claim 12, which is selected from the group consisting of construction adhesives, plasters, renders, trowelling compositions, floor-filling compositions, jointing mortars, and paints.

14. A coating composition or adhesive containing, as the sole binder, the protective-colloid-stabilized polymer prepared by the process of claim 1.

15. A composition for the coating or binding of textiles or paper containing, as the sole binder, the protective-colloid-stabilized polymer prepared by the process of claim 1.